

CLAIMS

What is claimed is:

1. A method, implemented in a computer system comprising a processor, memory accessible by the processor, and computer program instructions stored in the memory and executable by the processor, the method comprising:

receiving input data relating to communications among persons, the input data comprising a plurality of modalities;

extracting features relating to the plurality of modalities from the received input data;

performing multimodal fusion on the extracted features, wherein the multimodal fusion is performed on at least some of the features relating to individual modalities and on at least some combinations of features relating to a plurality of modalities;

classifying the fused features using a trained model for detection of at least one mental disorder; and

generating a representation of a disorder state based on the classified fused features.

2. The method of claim 1, wherein the plurality of modalities comprises text information, audio information, and video information.

3. The method of claim 2, wherein the multimodal fusion is performed on at least some of the text information, audio information, video information, text-audio information, text-video information, audio-video information, and text-audio-video information.

4. The method of claim 3, wherein the mental disorder is one of depression, anxiety, suicidal ideation, and post-traumatic stress disorder.
5. The method of claim 3, wherein the mental disorder is depression and the representation of the disorder state is one of a predicted PHQ-9 and a CES-D Depression Score.
6. The method of claim 3, wherein the persons are any of at least one of age, gender, race, nationality, ethnicity, culture, and language.
7. The method of claim 3, wherein the method is implemented as a stand-alone application, is integrated with a telemedicine/telehealth platform, is integrated with other software, or is integrated with other applications/marketplaces that provide access to counselors and therapy.
8. The method of claim 3, wherein the method is used for at least one of screening in clinical settings (ER visits, primary care, pre and post-surgery), validating clinical observations (provision of 2nd opinions, expediting complicated diagnostic paths, verifying clinical determinations), screening in the field (at home, school, workplace, in the field), virtual follow up via telehealth scenarios (synchronous - video call with patient, asynchronous - video messages), self-screening for consumer use (triage channels, self-administered assessments, referral mechanisms), screening through helplines (suicide prevention, employee assistance).
9. A system comprising a processor, memory accessible by the processor, and computer program instructions stored in the memory and executable by the processor to perform:

receiving input data relating to communications among persons, the input data comprising a plurality of modalities;

extracting features relating to the plurality of modalities from the received input data;

performing multimodal fusion on the extracted features, wherein the multimodal fusion is performed on at least some of the features relating to individual modalities and on at least some combinations of features relating to a plurality of modalities;

classifying the fused features using a trained model for detection of at least one mental disorder; and

generating a representation of a disorder state based on the classified fused features.

10. The system of claim 9, wherein the plurality of modalities comprises text information, audio information, and video information.

11. The system of claim 10, wherein the multimodal fusion is performed on at least some of the text information, audio information, video information, text-audio information, text-video information, audio-video information, and text-audio-video information.

12. The system of claim 11, wherein the mental disorder is one of depression, anxiety, suicidal ideation, and post-traumatic stress disorder.

13. The system of claim 11, wherein the mental disorder is depression and the representation of the disorder state is one of a predicted PHQ-9 and a CES-D Depression Score.

14. The system of claim 11, wherein the persons may be of any of at least one of age, gender, race, nationality, ethnicity, culture, and language.

15. The system of claim 11, wherein the method is implemented as a stand-alone application, is integrated with a telemedicine/telehealth platform, is integrated with other software, or is integrated with other applications/marketplaces that provide access to counselors and therapy.

16. The system of claim 11, wherein the method is used for at least one of screening in clinical settings (ER visits, primary care, pre and post-surgery), validating clinical observations (provision of 2nd opinions, expediting complicated diagnostic paths, verifying clinical determinations), screening in the field (at home, school, workplace, in the field), virtual follow up via telehealth scenarios (synchronous - video call with patient, asynchronous - video messages), self-screening for consumer use (triage channels, self-administered assessments, referral mechanisms), screening through helplines (suicide prevention, employee assistance).

17. A computer program product comprising a non-transitory computer readable storage having program instructions embodied therewith, the program instructions executable by a computer, to cause the computer to perform a method comprising:

receiving input data relating to communications among persons, the input data comprising a plurality of modalities;

extracting features relating to the plurality of modalities from the received input data;

performing multimodal fusion on the extracted features, wherein the multimodal fusion is performed on at least some of the features relating to individual modalities and on at least some combinations of features relating to a plurality of modalities;

classifying the fused features using a trained model for detection of at least one mental disorder; and

generating a representation of a disorder state based on the classified fused features.

18. The computer program product of claim 17, wherein the plurality of modalities comprises text information, audio information, and video information.

19. The computer program product of claim 18, wherein the multimodal fusion is performed on at least some of the text information, audio information, video information, text-audio information, text-video information, audio-video information, and text-audio-video information.

20. The computer program product of claim 19, wherein the mental disorder is one of depression, anxiety, suicidal ideation, and post-traumatic stress disorder.

21. The computer program product of claim 19, wherein the mental disorder is depression and the representation of the disorder state is one of a predicted PHQ-9 and a CES-D Depression Score.

22. The computer program product of claim 19, wherein the persons may be of any of at least one of age, gender, race, nationality, ethnicity, culture, and language.

23. The computer program product of claim 19, wherein the method is implemented as a stand-alone application, is integrated with a telemedicine/telehealth platform, is integrated with other software, or is integrated with other applications/marketplaces that provide access to counselors and therapy,

24. The computer program product of claim 19, wherein the method is used for at least one of screening in clinical settings (ER visits, primary care, pre and post-surgery), validating clinical observations (provision of 2nd opinions, expediting complicated diagnostic paths, verifying clinical determinations), screening in the field (at home, school, workplace, in the field), virtual follow up via telehealth scenarios (synchronous - video call with patient, asynchronous - video messages), self-screening for consumer use (triage channels, self-administered assessments, referral mechanisms), screening through helplines (suicide prevention, employee assistance).